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ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/641,591	ROSEDALE, PHILIP	
	Examiner	Art Unit	
	Thomas H. Stevens	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 August 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-54* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-54* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 August 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/16/00*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The following listing of references in the specification is not a proper information disclosure statement:

- Precision Strain Gauge SG-7/350-Ly11 Omega Engineering, Inc. of Stamford, CT (pg.9).
- Proprioceptive Illusions Induced by Muscle Vibration: Contribution by Muscle Spindles to Perception?" by Goodwin et al. (Science 715:1382-1384; published 24 March 1972).

37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A (1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper."

Claim Interpretation

2. Office personnel are to give claims their **"broadest reasonable interpretation"** in light of the supporting disclosure. *In re Morris,* 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. *In re Prater,* 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551(CCPA 1969). See *also *In re Zletz,* 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322(Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow") .... The reason is simply that during patent prosecution when claims can be amended, ambiguities should

be recognized, scope and breadth of language explored, and clarification imposed .... An essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process. **The examiner equates vibration of the sensors as reactionary impulses to the change of body movement regardless of magnitude; and any change of body displacement is considered inherent to feedback from the computer to the user. Also, any description of headgear complementary to the virtual world is considered inherent.**

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 11 and 26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. Claim 11: No mention of signal generator anywhere in the specification. Claim 26: No clear description of "passive feedback" in the specification.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

6. Regarding claims 4, 30 and 35 the phrase "substantially"; and claim 43, the phrase "one or more buttons" renders the claims indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

7. Furthermore, claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The language around the word "*adapted*" raises a question as to the limiting effect of the language in a claim.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 6-14 are rejected under 35 U.S.C. 102(a) as being anticipated by Latypov et al. (U.S. Patent 6,005,548 (1999)).

Latypov et al. teaches methods and systems for determining position and orientation of users in a space and display of virtual space, and can be interactive. Additionally, sensors for tracking angular position of segments of the user's locomotor system are attached at places or articulations of segments arranged are main means for determination of reference directions (abstract).

Claim 6: A method for providing feedback to a user of a processing unit, comprising the steps of: providing an immobilizing device which holds a portion of the user's body immobile (column 7 lines 24-51 and column 8 lines 63-67); providing vibrating devices (column 14, lines 41-43) disposed upon the immobilizing device and positioned to touch the immobilized portion of the user's body near muscles which would extend if the immobilized portion of the user's body moved; sending signals from the processing unit to the vibrating devices to cause the vibrating devices to vibrate; controlling these signals such that the vibrating devices located near a particular muscle vibrate to provide feedback indicating that the immobilized portion of the user's body is moving.

Claim 7: A method as in Claim 6 wherein the signals sent to the vibrating devices by the processing unit are controlled based upon the forces exerted by the

immobilized portion of the user's body against the immobilizing device (column 7, lines 1-6).

Claim 8: A method as in Claim 7 wherein the forces exerted against the immobilizing device are measured using strain gauges disposed upon the immobilizing device (column 7, lines 1-6).

Claim 9: A method as in Claim 7 wherein the signals are sent to the vibrating devices such that the feedback provided indicates to the user that the immobilized portion of the user's body is moving in the way it would have moved were it not immobilized (column 7, lines 6-20).

Claim 10: An input system for a user comprising an immobilizing device which restricts (column 3, 20-23) the motion of a portion of the user's body, a vibrating device disposed substantially adjacent to a nerve spindle of a muscle of the user's body which extends when the restricted portion of the user's body moves, and a processing unit (column 4, lines 22-26) which sends signals to the vibrating devices to control the operation of the vibrating devices, the processing unit controlling the signals such that the vibrating devices located adjacent(column 3, lines 44-45) to a particular muscle provide feedback indicating that the restricted portion of the user's body is moving.

Claim 11: An input system as in Claim 10 wherein the vibrating device comprises a signal generator adapted for connection to a body at a location (column 5, lines 30-35) such that it will affect the signal sent by the nerve spindle to the brain.

Claim 12: An input system as Claim 10 wherein the signals sent to the vibrating devices (column 14, lines 41-43) by the processing unit are controlled based upon the forces exerted by the immobilized portion of the user's body against the immobilizing device.

Claim 13: An input system as in Claim 12 wherein the forces (column 7, lines 6-20) exerted against the immobilizing device are measured using strain gauges disposed upon the immobilizing device.

Claim 14: An input system as in Claim 10 wherein the signals are sent to the vibrating devices such that the feedback (column 7, lines 6-20) provided indicates to the user that the immobilized portion of the user's body is moving in the way it would have moved were it not immobilized (column 8, lines 9-11).

10. Claims 15-22, 52-54 are rejected under 35 U.S.C. 102(e) as being anticipated by Tremblay et al. (U.S. Patent 6,275,213 (1998)).

Tremblay teaches a man-machine interface, which provides tactile feedback to various sensing body parts, is disclosed. The device employs one or more vibrotactile units, where each unit comprises a mass and a mass-moving actuator. As the mass is

accelerated by the mass-moving actuator, the entire vibrotactile unit vibrates. Thus, the vibrotactile unit transmits a vibratory stimulus to the sensing body part to which it is affixed. The vibrotactile unit may be used in conjunction with a spatial placement-sensing device, which measures the spatial placement of a measured body part. A computing device uses the spatial placement of the measured body part to determine the desired vibratory stimulus to be provided by the vibrotactile unit. In this manner, the computing device may control the level of vibratory feedback perceived by the corresponding sensing body part in response to the motion of the measured body part. The sensing body part and the measured body part may be separate or the same body part (abstract).

Claim 15: A method for providing, an indication to a user that his body has moved when it has not, comprising: detecting the intended motion of a portion of the user's body; providing sensory feedback, which is a reflection of the intended motion (column 17, lines 34-67; and column 18, lines 1-25).

Claim 16: A method as in Claim 15 further comprising the step of immobilizing the portion of the user's body (figure 23).

Claim 17: A method as in Claim 15 wherein the sensory feedback comprises a vibration produced by a vibrating element placed against the user's body (column 15, lines 1-12).

Claim 18: A method as in Claim 17 wherein the sensory feedback provided suspends the feedback provided naturally by the user's body, which reflects the actual motion of the portion of the user's body (column 15, lines 13-22).

Claim 19: A method as in Claim 16 wherein the step of immobilizing a portion of the user's body further comprises attaching the portion of the user's body to a rigid structure so as to restrict the motion of the portion of the user's body (column 11, lines 38-47).

Claim 20: A method as in Claim 19 wherein the step of detecting the intended motion comprises measuring the force (column 12, lines 62-65) applied against the rigid structure by the immobilized portion of the user's body.

Claim 21: A method as in Claim 20 wherein the force applied against the rigid structure is measured by using strain gauges to detect the deflection of the structure due to the force applied against it (column 13, lines 1-5).

Claim 22: A method as in Claim 15 wherein the step of detecting the intended motion comprises measuring the direction and magnitude of the forces applied by the immobilized portion of the user's body (column 15, lines 50-54).

Claim 52: A method for a user to control an environment simulated on a computer system where the user is modeled within the simulated environment, comprising (column 17, lines 34-67; and column 18, lines 1-25): providing at least one immobilizing device which restricts the motion of at least a portion of the user's body; detecting the forces exerted by the immobilized portion of the user's body against the immobilizing device; sending a signal representing these forces (column 4, lines 10-16) to the computer system; and determining the effect that these forces have upon the model of the user in the environment simulated by the computer.

Claim 53: A method as in Claim 52 wherein forces exerted by the immobilized portion of the user's body (column 4, lines 20-27) are detected by measuring the deflection of the immobilizing device.

Claim 54: A method as in Claim 53 wherein the deflection of the immobilizing device is measured using strain gauges (column 13, lines 1-4) disposed upon the immobilizing device.

Claim Rejections - 35 USC § 103

11. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claims 1-5, 23,24,26-44 are rejected under 35 U.S.C. 103 (a) as unpatentable over Marci et al. (U.S. Patent 6,183,259 (1998)) in view of Latypov et al. (U.S. Patent 6,005,548 (1999)).

Marci et al. teaches the simulation of physical movements with, subsequently, the use of a joystick and other input devices (column 7, lines 26) in which the user has control of images (abstract). However the invention doesn't teach human simulation via motion sensors.

Latypov et al. teaches methods and systems for determining position and orientation of users in a space and display of virtual space, and can be interactive. Additionally, sensors for tracking angular position of segments of the user's locomotor system are attached at places or articulations of segments arranged are main means for determination of reference directions (abstract).

It would have been obvious at the time of invention to one of ordinary skill in the art to modify the teachings of Marci et al. in view of Latypov et al. since it would be advantageous to inject the individual's body images (Latypov: figure 1) for simulation of an physical event for simulation and immediate feedback in real-time (Marci: column 2, lines 41-56).

Claim 1: An input system for use, with a simulated environment (Macri: title; Latypov: column 4, lines 24-25), comprising: an immobilizing device (Latypov: column 2, lines 54-56), which restricts the motion of a portion of a user's body; sensors, which detect forces applied by the restricted portion of the user's body; a sensory feedback device (Latypov: column 6, line 67 and column 7, line 1), which provides a sensation to the user corresponding to the motion, which occurs in the simulated environment.

Claim 2: An input system as in Claim 1 wherein the forces detected by the sensors are sent to the processing unit (Macri: column 7, lines 56-67) to determine the motion of the user in the simulated environment to which the sensations provided by the sensory feedback device will correspond (Latypov: column 13, lines 30-43).

Claim 3: An input system as in Claim 1(Macri: title; Latypov: column 4, lines 24-25) wherein the sensors comprise strain gauges, which are disposed upon the immobilizing device (Latypov: column 6, line 67 and column 7, line 1).

Claim 4: An input system as in Claim 1(Macri: title; Latypov: column 4, lines 24-25) wherein the sensory feedback device comprises at least one vibrating element, which is disposed substantially adjacent to a nerve spindle of a muscle of the restricted portion of the user's body (Latypov: column 5, lines 30-35).

Claim 5: An input device as in Claim 1 (Macri: title; Latypov: column 4, lines 24-25) wherein the sensory feedback device is used to provide a sensation of movement to the user when no actual movement of the type corresponding to the sensation occurs (Latypov: column 6, lines 8-10).

Claim 23: An input system for use with a simulator (Macri: column 4, lines 39-62; Latypov: column 4, lines 24-25), comprising an immobilizing device (Macri: column 8, lines 4-8), a processing unit (Marci: figure 1 (202)), and an output system (Latypov: column 8, line 31), the immobilizing device holding the head of a user in a substantially fixed position with respect to the user's torso (Latypov: column 5, lines 30-35) and further comprising sensors to detect a force exerted by the user in attempting to move the user's head (Latypov: column 6, lines 65-66), and the processing unit (Latypov: column 13, lines 30-44) calculating the effect of the force applied by the user (column 7, lines 1-4) in a simulated environment and presenting this effect in the simulated environment to the user via the output system (Marci: column 8, lines 4-6).

Claim 24: An input system as in Claim 23 wherein the output system corresponds to a remotely (Marci, figure 3) operated physical device: which is operated according to the input system and which is controlled through the processing unit and represented in the simulated environment (Latypov: column 5, lines 53-61).

Claim 26: An input system as in Claim 23 wherein the processing unit is programmed to use a physical model for the simulated environment (Marci: column 4, lines 39-63), which provides passive feedback by immobilizing the user such that the user applies force against the immobilizing device in a manner, which reflects the forces, which would be applied to the user in the simulated environment (Latypov: column 7, lines 1-6).

Claim 27. An input system as in Claim 23 wherein the immobilizing input device comprises a securement device within which the user places his head (Latypov: columns 1 and 2, lines 67 and 1, respectively) and which is rigidly attached to a seat upon which the user sits during use of the input system (Marci: figure 25).

Claim 28: An input system as in Claim 27(Marci: column 4, lines 39-63) wherein the securement device comprises a helmet (Latypov: column 2, line 1).

Claim 29: An input system as in Claim 27(Marci: column 4, lines 39-63) wherein the securement device comprises a stiff headband (Latypov: column 2, line 1).

Claim 30: An input system as in Claim 27(Marci: column 4, lines 39-63) wherein the securement device comprises a pair of substantially semi-circular braces, one of which is placed upon the rear of the user's head (Latypov: column 6, 64-67) and the other of which is fit snugly to the front of the user's head above the eyes and about the temples.

Claim 31: An input system as in Claim 27 wherein the securement device is attached to the seat (Marci: figure 25) of the system using at least one support member (Latypov: column 2, lines 23-26).

Claim 32: An input system as in Claim 31 wherein the sensors (Latypov: column 7, lines 1-6) are disposed upon the support member (Marci: figure 25).

Claim 33: An input system as in Claim 23(Macri: column 4, lines 39-62) wherein the sensors comprise strain gauges (Latypov: column 7, lines 1-6).

Claim 34: An input system as in Claim 33 (Macri: column 4, lines 39-62) wherein the sensors are disposed in two (Latypov: column 8, lines 37-41) sets of opposing pairs on each support member.

Claim 35: An input system as in Claim 23 (Macri: column 4, lines 39-62) further comprising at least one additional immobilizing device which holds an arm of the user from the elbow (Latypov: column 5, lines 30-35) to the hand in a substantially fixed position with respect to the torso of the user and which further comprises sensors

(Latypov: column 8, lines 37-41) disposed so as to measure the forces (Latypov: column 7, lines 1-6) exerted by the arm of the user at least at a point near the elbow of the user and at a point near the wrist of the user.

Claim 36: An input system as in Claim 35(Macri: column 4, lines 39-62) wherein the additional immobilizing device detects the forces exerted by the user in attempting to move his arm and sends this information to the processing unit (Latypov: column 5, lines 30-67).

Claim 37: An input system as in Claim 23 (Macri: column 4, lines 39-62; Latypov: column 4, lines 24-25) further comprising at least one additional immobilizing device which holds a leg of the user from the knee to the foot (Latypov: column 5, lines 30-35) in a substantially fixed position with respect to his torso and which further comprises pressure sensors disposed so as to measure the forces (Latypov: column 7, lines 1-6) exerted by the leg of the user at least at a point near the knee of the user and at a point near the ankle of the user (Latypov: column 5, lines 30-35).

Claim 38: An input system as in Claim 37 (Macri: column 4, lines 39-62; Latypov: column 4, lines 24-25) wherein the additional immobilizing device detects the forces exerted by the user (Latypov: column 7, lines 1-6) in attempting to move his leg (Latypov: column 5, lines 30-35) and sends this information to the processing unit (Marci: figure 1, 202).

Claim 39: An input system as in Claim 23(Macri: column 4, lines 39-62; Latypov: column 4, lines 24-25) wherein the visual display of the output system fills substantially all of the visual field of view of the user when the user's head is immobilized within the input system.

Claim 40: An input system as in Claim 39 (Macri: column 4, lines 39-62; Latypov: column 4, lines 24-25) wherein the visual display comprises a Screen (Marci: figure 12), which is positioned between the user's head and a projection system located on the opposite side of the screen as the user's head (Latypov: column 2, line 1).

Claim 41: An input system as in Claim 23(Macri: column 4, lines 39-62; Latypov: column 4, lines 24-25) wherein additional input signals are sent to the processing unit by an additional input device (Latypov: column 13, lines 9-15) disposed upon the immobilizing device.

Claim 42: An input system as in Claim 41(Macri: column 4, lines 39-62; Latypov: column 4, lines 24-25) wherein the additional input device comprises a gun handle and trigger (Latypov: column 13, lines 9-15).

Claim 43: An input system as in Claim 41(Macri: column 4, lines 39-62; Latypov: column 4, lines 24-25) wherein the additional input device comprises one or more buttons (Latypov: column 13, lines 9-15).

Claim 44: An input system as in Claim 41(Macri: column 4, lines 39-62; Latypov: column 4, lines 24-25) wherein the additional input device comprises a joystick (Latypov: column 13, lines 9-15).

14. Claims 25, 45-51 are rejected under 35 U.S.C. 103 (a) as unpatentable over Marci et al. (U.S. Patent 6,183,259 (1998)) in view of Latypov et al. (U.S. Patent 6,005,548 (1999)) and in further view of Tremblay et al. (U.S. 6,275,213 (1998)).

Marci et al. teaches the simulation of physical movements with, subsequently, the use of a joystick and other input devices (column 7, lines 26) in which the user has control of images (abstract). However the invention doesn't teach human simulation via motion sensors or significant vibration of sensors.

Latypov et al. teaches methods and systems for determining position and orientation of users in a space and display of virtual space, and can be interactive. Additionally, sensors for tracking angular position of segments of the user's locomotor system are attached at places or articulations of segments arranged are main means for determination of reference directions (abstract); but doesn't disclose sensor vibration.

Tremblay teaches a man-machine interface, which provides tactile feedback to various sensing body parts, is disclosed. The device employs one or more vibrotactile

units, where each unit comprises a mass and a mass-moving actuator. As the mass is accelerated by the mass-moving actuator, the entire vibrotactile unit vibrates.

It would have been obvious at the time of invention to one of ordinary skill in the art to modify the teachings of Marci et al. in view of Latypov et al. and in view further view of Tremblay since it would be advantageous to inject the individual's body images (Latypov: figure 1) for simulation, via the motion sensors, of an physical event for simulation and immediate feedback in real-time (Marci: column 2, lines 41-56), while providing full force and tactile feedback to a user to make the virtual reality or telerobotic experience as realistic as possible (Tremblay: column 1, lines 52-55).

Claim 25: An input system as in Claim 23(Macri: column 4, lines 39-62; Latypov: column 4, lines 24-25) further comprising vibration devices, the vibration devices touching (Tremblay: figures 3-4) the user within the immobilizing device (Latypov: column 5, lines 40-45) and being controlled by the processing unit to provide sensations for the user which mimic the sensations (Marci: column 7 and 8, lines 59-65, 3-8, respectively) which would be felt during motion of the immobilized portion of the user's body as it moves in the simulated environment.

Claim 45: An input system for use with a computer, comprising at least one immobilizing device which holds a portion of the body of a user of the system in a substantially fixed position, the immobilizing device comprising sensors (Macri: column 4, lines 39-62; Latypov: column 4, lines 24-25) and vibration devices (Tremblay: column

3, lines 50-61), the sensors being configured to detect forces exerted by the user in attempting to move the portion of the body held by the immobilizing device, the sensors sending signals representing the magnitude and direction of these forces (Tremblay: column 6, lines 65-67) to the computer (Tremblay: column 6, lines 44-49), and the vibration devices disposed upon the muscles of the user and controlled by the computer so as to provide sensations which mimic the sensations which would be felt if the attempted motion had occurred (Tremblay: columns 17 and 18, lines 34-67 and 1-24, respectively).

Claim 46: An input system as in Claim 45 (Macri: column 4, lines 39-62; Latypov: column 4, lines 24-25) further comprising a movable frame which is connected to the computer and actuators which are capable of moving the frame, wherein the user and the immobilizing device are located within the frame, and the actuators are controlled by the computer so as to coordinate the motion of the frame to provide motion feedback to the user of the system (Tremblay: column 9, claim 7).

Claim 47: An input system as in Claim 45 (Macri: column 4, lines 39-62; Latypov: column 4, lines 24-25;Tremblay: column 3, lines 50-61) wherein the head of the user is immobilized with respect to the torso of the user by the immobilizing device and further comprising a visual display disposed in fixed relation to the user's head, the display connected to the computer and configured to provide visual feedback to the user of the system (Tremblay: column 17, line 34-57).

Claim 48: An input system as in Claim 47 (Macri: column 4, lines 39-62; Latypov: column 4, lines 24-25;Tremblay: column 3, lines 50-61) wherein the visual feedback provided encourages the user to apply forces to the immobilizing device in order to control the visual display (Tremblay: figure 20).

Claim 49: An input system as in Claim 45 (Macri: column 4, lines 39-62; Latypov: column 4, lines 24-25;Tremblay: column 3, lines 50-61) wherein the input system is used to control a physical device, which is connected to the computer (Tremblay: figure 20).

Claim 50: An input system as in Claim 49 (Macri: column 4, lines 39-62; Latypov: column 4, lines 24-25;Tremblay: column 3, lines 50-61) wherein the physical device comprises a remotely operated machine (Tremblay: column 17, lines 64-7; and column 18, lines 1-4).

Claim 51: An input system as in Claim 49 (Macri: column 4, lines 39-62; Latypov: column 4, lines 24-25;Tremblay: column 3, lines 50-61) wherein the computer controls the vibration devices to provide feedback to the user which is based upon the motion of the physical device (Tremblay: column 6, lines 42- 49).

Correspondence Information

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom Stevens whose telephone number is (703) 305-0365, Monday-Friday (8:30 am- 5:30 pm) or contact Supervisor Mr. Kevin Teska at (703) 305-9704. The fax number for the group is 703-872-9306.

Any inquires of general nature or relating to the status of this application should be directed to the Group receptionist whose phone number is (703) 305-3900.

March 15, 2004

THS

KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER